

**Thunderstorms.**—The dates on which the number of reports of thunderstorms for the whole country were most numerous were: 18th, 184; 19th, 180; 15th, 150; 17th, 146; 16th, 144.

Reports were most numerous from Missouri, 215; Illinois, 211; Ohio, 171; Kansas, 96; Arkansas, 93.

**Auroras.**—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 3d to the 11th, inclusive.

The greatest number of reports were received for the following dates: 13th, 30; 14th, 289; 15th, 252; 16th, 27.

Reports were most numerous from Illinois, 56; Wisconsin,

54; New York, 52; Ohio, 48; Massachusetts, 47; Minnesota, 42.

**In Canada.**—Auroras were reported as follows: Halifax, 14, 15; Grand Manan, 15; Yarmouth, 14, 15; Charlottetown, 15; Father Point, 15; Quebec, 15, 20; Montreal, 14, 15, 16; Rockliffe, 14, 15; Toronto, 14; White River, 15, 16, 18; Port Stanley, 14; Saugeen, 14; Parry Sound, 15; Minnedosa, 18, 19, 20, 22; Swift Current, 26; Prince Albert, 9, 21, 26, 29, 30; Battleford, 21, 25, 26, 27; Esquimalt, 14, 15, 16.

Thunderstorms were reported as follows: Montreal, 17; Toronto, 16, 19, 28; White River, 27; Port Stanley, 16, 17; Parry Sound, 15, 16.

## CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches.

**Alabama.**—The mean temperature was 59.6°, or 4.8° above normal; the highest was 89°, at Eufaula on the 24th, and the lowest, 23°, at Hamilton on the 4th and at Jasper on the 5th. The average precipitation was 3.22, or 2.43 below normal; the greatest monthly amount, 5.41, occurred at Newburg, and the least, 0.34, at Citronelle.—*F. P. Chaffee.*

**Arizona.**—The mean temperature was 50.7°, or about 5.0° below normal; the highest was 92°, at Fort Mohave on the 8th, and the lowest, zero, at Williams on the 14th. The average precipitation was 0.72, or slightly below normal; the greatest monthly amount, 3.89, occurred at Payson, while none fell at several stations.—*W. T. Blythe.*

**Arkansas.**—The mean temperature was 54.5°, or 3.4° above normal; the highest was 88°, at four stations on several dates, and the lowest, 18°, at Oregon, on the 3d and at Silversprings on the 24th. The average precipitation was 5.96, or 0.43 above normal; the greatest monthly amount, 17.56, occurred at Winslow, and the least, 1.20, at Fulton.—*E. B. Richards.*

**California.**—The mean temperature was 48.8°, or 3.6° below normal; the highest was 95°, at Salton on the 2d and 6th, and at Palm Springs on the 9th; the lowest was 16° below zero, at Bodie on the 18th. The average precipitation was 0.66, or 2.64 below normal; the greatest monthly amount, 4.22, occurred at Morses House, while none fell at several stations.—*W. H. Hammon.*

**Colorado.**—The mean temperature was 31.8°, or 3.0° below normal; the highest was 80°, at Lamar and Minneapolis on the 25th, and the lowest, 25° below zero, at Steamboat Springs on the 23d. The average precipitation was 0.88, or 0.38 below normal; the greatest monthly amount, 9.25, occurred at Ruby, and the least, 0.02, at Fort Morgan.—*P. H. Brandenburg.*

**Florida.**—The mean temperature was 67.5°, or about 2.0° above normal; the highest was 94°, at Bartow on the 23d, and the lowest, 30, at De Funiak Springs on the 5th. The average precipitation was 1.54, or considerably below normal; the greatest monthly amount, 3.26, occurred at Jupiter, while none fell at Kissimmee.—*A. J. Mitchell.*

**Georgia.**—The mean temperature was 61.0°, or 4.5° above normal; the highest was 90°, at Bellville on the 19th, and the lowest, 20, at Hopkinsville on the 5th. The average precipitation was 2.82, or 2.22 below normal; the greatest monthly amount, 8.52, occurred at Clayton, and the least, 0.91, at Hawkinsville.—*J. B. Marbury.*

**Idaho.**—The mean temperature was 31.4°; the highest was 74°, at New Plymouth on the 2d, and the lowest, 26° below zero, at Warren on the 22d. The average precipitation was 1.06; the greatest monthly amount, 3.23, occurred at Murray, and the least, trace, at Blackfoot and Chesterfield.—*D. P. McCallum.*

**Illinois.**—The mean temperature was 43.4°, or 4.8° above normal; the highest was 79° at Golconda on the 22d, and at Equality on the 26th, and the lowest, zero, at Lanark on the 3d. The average precipitation was 7.29, or 3.82 above normal; the greatest monthly amount, 14.16, occurred at Cobden, and the least, 2.66, at Lanark.—*C. E. Linney.*

**Indiana.**—The mean temperature was 45.8°, or 7.1° above normal; the highest was 83°, at Vevay on the 19th, and the lowest, 11°, at Hammond on the 2d. The average precipitation was 8.11, or 4.39 above normal; the greatest monthly amount, 14.65, occurred at Princeton, and the least, 0.59, at Hammond.—*C. F. R. Wapnerhans.*

**Iowa.**—The mean temperature was 37.5°, or several degrees above normal; the highest was 72°, at College Springs on the 26th, and the lowest,

2°, at Eldora, Neola, and Rock Rapids on the 1st, 22d, and 23d. The average precipitation was 1.94, or slightly above normal; the greatest monthly amount, 6.21, occurred at Fort Madison, and the least, 0.33, at Marshalltown.—*G. M. Chappel.*

**Kansas.**—The mean temperature was 43.0°, or 2.0° above normal; the highest was 85°, at Englewood on the 8th, and the lowest, 7° below zero, at Coolidge on the 22d. The average precipitation was 1.52, or 0.05 below normal; the greatest monthly amount, 6.72, occurred at Oswego, and the least, trace, at Coolidge and Macksville.—*T. B. Jennings.*

**Kentucky.**—The mean temperature was 50.7°, or 4.6° above normal; the highest was 84°, at Alpha and Williamsburg on the 19th, and the lowest, 16°, at Loretto on the 4th. The average precipitation was 7.59, or 2.40 above normal; the greatest monthly amount, 10.33, occurred at Lyndon, and the least, 2.75, at Williamsburg.—*G. E. Hunt.*

**Louisiana.**—The mean temperature was 62.4°, or about 2.0° above normal; the highest was 88°, at five stations on several dates, and the lowest, 22°, at Robeline on the 4th. The average precipitation was 2.88, or 1.75 below normal; the greatest monthly amount, 5.99, occurred at White Sulphur Springs, and the least, 0.55, at Donaldsonville.—*R. E. Kerkum.*

**Maryland and Delaware.**—The mean temperature was 47.6°, or 7.4° above normal; the highest was 84°, at Boettcherville and Cumberland, Md., on the 19th, and the lowest, 7°, at Deerpark, Md., on the 1st. The average precipitation was 3.66, or 0.34 above normal; the greatest monthly amount, 8.34, occurred at Sunnyside, Md., and the least at Distributing Reservoir, D. C.—*F. J. Wals.*

**Michigan.**—The mean temperature was 35.4°, or 7.2° above normal; the highest was 72°, at Mottville and Vandalia on the 16th and at Berrien Springs on the 21st, and the lowest, 19° below zero, at Humboldt on the 3d. The average precipitation was 3.20, or 1.38 above normal; the greatest monthly amount, 6.68, occurred at Howell Junction, and the least, 0.42, at Ewen.—*C. F. Schneider.*

**Minnesota.**—The mean temperature was 30.1°, or about 5.0° above normal; the highest was 67°, at Beardsley on the 7th, and the lowest, 18° below zero, at Tower on the 2d. The average precipitation was 1.21, or slightly below normal; the greatest monthly amount, 2.97, occurred at Mapleplain, and the least, 0.20, at Milaca.—*T. S. Outram.*

**Mississippi.**—The mean temperature was 60.1°, or 3.7° above normal; the highest was 91°, at Columbus on the 21st, and the lowest, 20°, at Louisville on the 3d. The average precipitation was 3.93, or 2.22 below normal; the greatest monthly amount, 6.87, occurred at Jackson, and the least, 0.15, at Mosspoint.—*R. J. Hyatt.*

**Missouri.**—The mean temperature was 44.8°, or 2.7° above normal; the highest was 83°, at Malden on the 18th, and the lowest, 9°, at Potosi on the 4th. The average precipitation was 7.18, or 3.78 above normal; the greatest monthly amount, 15.48, occurred at Willowsprings, and the least, 1.63, at Bolckow. The precipitation was remarkably heavy over the eastern and southern portions of the State.—*A. E. Hackett.*

**Montana.**—The mean temperature was 23.6°, or below normal; the highest was 68°, at Billings on the 7th, at Choteau on the 6th, and at Fort Logan on the 2d; the lowest was 37° below zero, at Adel on the 22d. The average precipitation was 2.01, or 0.96 above normal; the greatest monthly amount, 4.60, occurred at Dearborn Canyon, and the least, 0.30, at St. Pauls.—*J. Warren Smith.*

**Nebraska.**—The mean temperature was 35.0°, or about 1.0° above normal; the highest was 81°, at Curtis on the 8th, and the lowest, 14° below zero, at Gering on the 22d. The average precipitation was 0.61, or about 0.56 below normal; the greatest monthly amount, 2.25, occurred at Burchard, and the least, trace, at several stations in the western section.—*G. A. Loveland.*

**Nevada.**—The mean temperature was 35.0°, or about 4.0° below normal; the highest was 79°, at St. Thomas on the 4th, and the lowest, 10° below zero, at Wells on the 15th. The average precipitation was 0.63,

or about 0.50 below normal; the greatest monthly amount, 2.01, occurred at Ely, while only traces fell at several stations in the south section.—*R. F. Young.*

**New England.**—The mean temperature was 38.4°, or 7.3° above normal; the highest was 69°, at Lowell, Mass., on the 11th, and the lowest, 12° below zero, at Flagstaff, Me., on the 4th. The average precipitation was 2.08, or 1.50 below normal; the greatest monthly amount, 4.27, occurred at Vineyard Haven, Mass., and the least, 0.30, at North Conway, N. H.—*J. W. Smith.*

**New Jersey.**—The mean temperature was 45.1°, or 7.9° above normal; the highest was 77°, at Asbury Park, Friesburg, and Vineland on the 19th, and the lowest, 16°, at Franklin Furnace on the 1st and 2d. The average precipitation was 3.33, or 0.64 below normal; the greatest monthly amount, 4.25, occurred at Staffordville, and the least, 2.56, at Atlantic City and Chester.—*E. W. McGann.*

**New Mexico.**—The mean temperature was 42.9°, or 1.5° below normal; the highest was 85°, at San Marcial on the 31st, and the lowest, zero, at Buckmans on the 14th. The average precipitation was about normal; the greatest monthly amount, 1.58, occurred at Gila, while none fell at Bluewater, Galisteo, and Raton.—*H. B. Hersey.*

**New York.**—The mean temperature was 40.6°, or 10.0° above normal; the highest was 73°, at Auburn and Avon on the 19th, and the lowest, 3° below zero, at North Lake on the 1st. The average precipitation was 2.35, or 0.44 below normal; the greatest monthly amount, 5.36, occurred at Bolivar, and the least, 0.61, at Garrattsville.—*R. G. Allen.*

**North Carolina.**—The mean temperature was 54.4°, or about 6.0° above normal; the highest was 91°, at Tarboro on the 21st, and the lowest, 15°, at Highlands on the 1st. The month was the warmest March on record. The average precipitation was 4.02, or 0.50 below normal; the greatest monthly amount, 11.30, occurred at Highlands, and the least, 1.52, at Wilmington.—*C. F. von Herrmann.*

**North Dakota.**—The mean temperature was 22.0°, or 1.7° above normal; the highest was 74°, at Berthold Agency on the 11th, and the lowest, 24° below zero, at Medora on the 26th. The average precipitation was 0.87, or 0.09 below normal; the greatest monthly amount, 2.16, occurred at Fort Yates, and the least, 0.16, at Woodbridge.—*B. H. Bronson.*

**Ohio.**—The mean temperature was 45.0°, or 8.0° above normal; the highest was 84°, at Pomeroy on the 22d, and the lowest, 5°, at Hillhouse on the 1st and at Bowling Green on the 3d. The average precipitation was 6.23, or 3.00 above normal; it was the wettest March in sixteen years; the greatest monthly amount, 11.07, occurred at Cedarville, and the least, 2.37, at Ashtabula.—*H. W. Richardson.*

**Oklahoma.**—The mean temperature was 48.8°; the highest was 85°, at Clifton and Kemp on the 16th, and the lowest, 7°, at Arapaho on the 27th. The average precipitation was 3.87; the greatest monthly amount, 12.25, occurred at Tahlequah, and the least, 0.13, at Hopeton.—*J. I. Widmeyer.*

**Oregon.**—The mean temperature was 39.9°, or 2.4° below normal; the highest was 74°, at Prineville, and the lowest, 4° below zero, at Silverlake. The average precipitation was 2.05, or 1.96 below normal; the greatest monthly amount, 8.61, occurred at Bay City, and the least, trace, at Burns and Riverside.—*B. S. Pague.*

**Pennsylvania.**—The mean temperature was 44.0°, or 9.3° above normal; the highest was 83°, at Hollidaysburg on the 19th, and the lowest, 4°, at Saegertown on the 1st. The average precipitation was 4.31, or 1.07 above normal; the greatest monthly amount, 8.40, occurred at Grampian, and the least, 2.06, at Athens.—*T. F. Townsend.*

**South Carolina.**—The mean temperature was 59.1°, or 5.1° above normal; the highest was 92°, at Gillisonville on the 23d, and the lowest, 22°, at Greenville on the 1st, and at Walhalla on the 8th. The

average precipitation was 2.99, or 1.47 below normal; the greatest monthly amount, 5.38, occurred at Trenton, and the least, 1.36, at Allendale.—*J. W. Bauer.*

**South Dakota.**—The mean temperature was 30.3°, or about 2.0° above normal; the highest was 74°, at Alexandria, Armour, and Greenwood on the 8th, and the lowest, 24° below zero, at Ashcroft on the 28th. The average precipitation was 0.83, or 0.25 below normal; the greatest monthly amount, 2.78, occurred at Ashcroft, and the least, 0.12, at Farmingdale.—*S. W. Glenn.*

**Texas.**—The mean temperature for the State during the month, determined by comparison with 38 stations distributed throughout the State, was 0.5° above the normal. Nearly normal conditions prevailed along the east coast, and there was a slight deficiency over west Texas and in some other localities, while there was a general excess for the month over other portions of the State. The greatest excess was over central Texas, with the greatest, 3.1°, at Menardville. The highest was 101°, at Fort McIntosh on the 19th, and the lowest, 11°, at Amarillo on the 23d. The average precipitation for the State during the month, determined by comparison with 39 stations distributed throughout the State, was 0.01 below the normal. There was a general deficiency over the panhandle and portions of west and central Texas, the eastern portion of north Texas, and east Texas, with the greatest, 2.41, at Weatherford. Over other portions of the State there was a general excess. Along the coast and in the vicinity of Forestburg and Camp Eagle Pass the excess was more than 1 inch. The greatest local excess for the month was 1.95, at Brazoria. The greatest monthly amount, 4.74, occurred at Conroe, while none fell at Fort Stockton.—*I. M. Cline.*

**Utah.**—The mean temperature was 34.2°; the highest was 80°, at St. George on the 7th, and the lowest, 14° below zero, at Heber on the 23d. The average precipitation was 1.24; the greatest monthly amount, 3.41, occurred at Scipio, and the least, trace, at Giles, Pahreah, and Tropic.—*J. H. Smith.*

**Virginia.**—The mean temperature was 50.0°, or about 6.0° above normal; it was the warmest March on record; the highest was 85°, at Bedford City on the 19th and at Petersburg on the 20th, and the lowest, 15°, at Dale Enterprise on the 1st. The average precipitation was 3.77, or 0.38 below normal; the greatest monthly amount, 5.10, occurred at Warsaw, and the least, 2.23, at Buckingham.—*E. A. Evans.*

**Washington.**—The mean temperature was 40.8°, or about normal; the highest was 71°, at Centerville on the 6th, and the lowest, 1°, at Hunters on the 22d. The average precipitation was 2.05, or 1.50 below normal; the greatest monthly amount, 7.42, occurred at Clearwater, and the least, trace, at Fort Simcoe.—*G. N. Salisbury.*

**West Virginia.**—The mean temperature was 48.5°, or about 6.0° above normal; the highest was 86°, at Eastbank on the 19th, and the lowest, 9°, at Oldfields on the 1st. The average precipitation was 5.43, or considerably above normal; the greatest monthly amount, 10.05, occurred at Weston, and the least, 1.25, at Nuttallburg.—*N. E. Taylor.*

**Wisconsin.**—The mean temperature was 33.9°, or 4.9° above normal; the highest was 66°, at Prairie du Chien on the 11th, and the lowest, 13° below zero, at Butternut and Hayward on the 4th. The average precipitation was 2.35, or 0.54 above normal; the greatest monthly amount, 4.50, occurred at Beloit, and the least, 0.30, at Bayfield.—*W. M. Wilson.*

**Wyoming.**—The mean temperature was 26.2°, or 5.4° below normal; the highest was 67°, at Fort Laramie on the 26th, and the lowest, 23° below zero, at Four Bear on the 22d. The average precipitation was 0.96, or 0.52 below normal; the greatest monthly amount, 2.73, occurred at Lander, and the least, 0.05, at Otto.—*W. S. Palmer.*

## RIVER AND FLOOD SERVICE.

By PARK MORRILL, Forecast Official, in charge of River and Flood Service.

The moderate stages of the rivers prevailing at the end of February continued during the first half of March. During this time the ice in the Missouri and upper Mississippi broke up well toward their headwaters. A slight rise followed in both these rivers and their combined effect produced a decided freshet wave in the Mississippi at St. Louis. From the 15th a great flood rose in the Ohio, coming largely from its northern tributaries. At Cincinnati the rise was continuous to a maximum height of 61.4 feet, which was reached on the 29th. This is the highest stage in March since the record began in 1858. Great destruction was wrought by the flood on the streams of Indiana and Ohio, as well as along the Ohio itself. The freshet from the upper Mississippi, joined to that from the Ohio, inaugurated a flood of considerable magnitude at Cairo. The rise commenced on the 13th and continued at

the end of the month, when a stage of 47.6 feet had been attained. Corresponding steady rises followed at Memphis, Vicksburg, and New Orleans.

Sharp but not very marked rises occurred near the middle of the month in the Arkansas and Red rivers. The freshets in the coastal rivers were slight and barely served to maintain navigable stages. Along streams where logging is carried on there is complaint of insufficient water to raft out the lumber.

The highest and lowest water, mean stage, and monthly range at 117 river stations are given in the accompanying table. Hydrographs for typical points on seven principal rivers are shown on the chart. The stations selected for charting are: Keokuk, St. Louis, Cairo, Memphis, and Vicksburg, on the Mississippi; Cincinnati, on the Ohio; Nashville,